WHAT IS CLAIMED IS:

1. A method of determining the amount of soluble hardness in the water of an industrial water system comprising the steps of:

1) providing an industrial water system;

2) providing a Compound, wherein said Compound is selected from the group of chemicals that develop a separate detectable fluorescent signal in the presence of soluble hardness;

3) extracting a sample of water from the industrial water system and determining whether the sample of water is at or below the maximum temperature of operability of said Compound, and if the sample of water is above the maximum temperature of operability of said Compound, then cooling said sample of water until the temperature of the sample of water is at or below the maximum temperature of operability of said Compound;

4) measuring the pH of the sample of water and determining whether the pH is between about 7.5 and about 13.5 and if the pH is not between about 7.5 and about 13.5, adjusting the pH of the sample of water such that the pH is between about 7.5 and about 13.5;

5) adding to said sample of water from about 1 ppb to about 3,000 ppm of said Compound;

6) providing a fluorometer;

7) using said fluorometer to measure the separate detectable fluorescent signal of said Compound in said sample of water;

8) using said separate detectable fluorescent signal to determine the amount of soluble hardness in said sample of water.

2. A method of determining the amount of soluble hardness in the water of an industrial water system comprising the steps of:

1) providing an industrial water system wherein the pH of the water in said industrial water system is between about 7.5 and about 13.5;

2) providing a Compound, wherein said Compound is selected from the group of chemicals that develops a separate detectable fluorescent signal in the presence of soluble hardness;

3) adding to the water of the industrial water system from about 1 ppb to about 3,000 ppm of said Compound, wherein said Compound is added to the water of the industrial water system at a point where the water is at or below the maximum temperature of operability of said Compound;

4) providing a fluorometer;

5) using said fluorometer to measure the separate detectable fluorescent signal of said Compound in said water of said industrial water system;

6) using said separate detectable fluorescent signal to determine the amount of soluble hardness in said water of said industrial water system.

3. A method of determining whether the appropriate level of treatment product, has been added to the water of an industrial water system comprising the steps of:

1) providing a treatment product, wherein said treatment product comprises scale inhibitor or dispersant or both, and an inert tracer in known proportions;

2) providing an industrial water system;

3) adding said treatment product to the water of said industrial water system;

4) providing a Compound, wherein said Compound is selected from the group of chemicals that develop a separate detectable fluorescent signal in the presence of soluble hardness;

5) extracting a sample of water from the industrial water system and determining whether the sample of water is at or below the maximum temperature of operability of said Compound, and if the sample of water is above the maximum temperature of operability of said Compound, then cooling said sample of water until the temperature of the sample of water is at or below the maximum temperature of operability of said Compound; wherein said sample of water is extracted from the industrial water system at a point where the water in the industrial water system has not had a treatment product added;

6) measuring the pH of the sample of water and determining whether the pH is between about 7.5 and about 13.5 and if the pH is not between about 7.5 and about 13.5, adjusting the pH of the sample of water such that the pH is between about 7.5 and about 13.5;

7) adding to said sample of water from about 1 ppb to about 3,000 ppm of said Compound;

8) providing at least one fluorometer;

9) using said fluorometer to measure the separate detectable fluorescent signal of said Compound in said sample of water;

10) using said separate detectable fluorescent signal to determine the amount of soluble hardness in said sample of water; and

11) increasing the feed rate of treatment product if step 10) shows there is an unacceptable level of soluble hardness present in the water and decreasing or maintaining the feed rate

of treatment product if step 10) shows that an unacceptable level of soluble hardness is not present in the sample of water; wherein the amount of treatment product being fed into the water is verified by

a) measuring the fluorescent signal of the inert tracer in said treatment product to determine how much inert tracer is present in the water; and

b) using the amount of inert tracer present to determine the amount of treatment product that is being fed into the water.

4. A method of determining whether the appropriate level of treatment product has been added to the water of an industrial water system comprising the steps of:

1) providing a treatment product, wherein said treatment product comprises scale inhibitor or dispersant or both, and an inert tracer in known proportions;

2) providing an industrial water system wherein the pH of the water in said industrial water system is between about 7.5 and about 13.5;

3) adding said treatment product to the water of said industrial water system;

4) providing a Compound, wherein said Compound is selected from the group of chemicals that develops a separate detectable fluorescent signal in the presence of soluble hardness;

5) adding to the water of the industrial water system from about 1 ppb to about 3,000 ppm of said Compound, wherein said Compound is added to the water of the industrial water system at a point where the water is at or below the maximum temperature of operability of said Compound;

6) providing at least one fluorometer;

7) using said fluorometer to measure the separate detectable fluorescent signal of said Compound in said water of said industrial water system; wherein the measurement takes place at a point where the water in the industrial water system has not had a treatment product added;

8) using said separate detectable fluorescent signal of said Compound to determine the amount of soluble hardness in said water, increasing the feedrate of treatment product if step 7) shows there is an unacceptable level of soluble hardness present in the water and decreasing or maintaining the feed rate of treatment product if step 7) shows that an unacceptable level of soluble hardness is not present in the water; wherein the amount of treatment product being fed into the water is verified by:

a) measuring the fluorescent signal of the inert tracer in said treatment product to determine how much inert tracer is present in the water; and

b) using the amount of inert tracer present to determine the amount of treatment product that is present in the water.

5. A method of determining whether the appropriate level of Selected Treatment Product has been added to the water of an industrial water system comprising the steps of:

1) providing a Selected Treatment Product, wherein said Selected Treatment Product comprises Selected Scale Inhibitor or Selected Dispersant or both, and an inert tracer in known proportions;

2) providing an industrial water system;

3) adding said Selected Treatment Product to the water of said industrial water system;

4) providing a Compound, wherein said Compound is selected from the group of chemicals that develop a separate detectable fluorescent signal in the presence of soluble hardness;

5) extracting a sample of water from the industrial water system and determining whether the sample of water is at or below the maximum temperature of operability of said Compound, and if the sample of water is above the maximum temperature of operability of said Compound, then cooling said sample of water until the temperature of the sample of water is at or below the maximum temperature of operability of said Compound;

6) measuring the pH of the sample of water and determining whether the pH is between about 7.5 and about 13.5 and if the pH is not between about 7.5 and about 13.5, adjusting the pH of the sample of water such that the pH is between about 7.5 and about 13.5;

7) adding to said sample of water from about 1 ppb to about 3,000 ppm of said Compound;

8) providing at least one fluorometer;

9) using said fluorometer to measure the separate detectable fluorescent signal of said Compound in said sample of water;

10) using said separate detectable fluorescent signal to determine the amount of soluble hardness in said sample of water; and

11) increasing the feed rate of Selected Treatment Product if step 10) shows there is an unacceptable level of soluble hardness present in the water and decreasing or maintaining the feed rate of Selected Treatment Product if step 10) shows that an unacceptable level of soluble hardness is not present in the sample of water; wherein the amount of Selected Treatment Product being fed into the water is verified by

a) measuring the fluorescent signal of the inert tracer in said Selected Treatment Product to determine how much inert tracer is present in the water; and

b) using the amount of inert tracer present to determine the amount of Selected Treatment Product that is being fed into the water.

6. A method of determining whether the appropriate level of Selected Treatment Product has been added to the water of an industrial water system comprising the steps of:

1) providing a Selected Treatment Product, wherein said Selected Treatment Product comprises Selected Scale Inhibitor or Selected Dispersant or both, and an inert tracer in known proportions;

2) providing an industrial water system wherein the pH of the water in said industrial water system is between about 7.5 and about 13.5;

3) adding said Selected Treatment Product to the water of said industrial water system;

4) providing a Compound, wherein said Compound is selected from the group of chemicals that develops a separate detectable fluorescent signal in the presence of soluble hardness;

5) adding to the water of the industrial water system from about 1 ppb to about 3,000 ppm of said Compound; wherein said Compound is added to the water of the industrial water system at a point where the water is at or below the maximum temperature of operability of said Compound.

6) providing at least one fluorometer;

7) using said fluorometer to measure the separate detectable fluorescent signal of said Compound in said water of said industrial water system;

8) using said separate detectable fluorescent signal of said Compound to determine the amount of soluble hardness in said water, increasing the feedrate of Selected Treatment Product if step 7) shows there is an unacceptable level of soluble hardness present in the water and decreasing or maintaining the feed rate of Selected Treatment Product if step 7) shows that an unacceptable level of soluble hardness is not present in the water; wherein the amount of Selected Treatment Product being fed into the water is verified by:

a) measuring the fluorescent signal of the inert tracer in said Selected Treatment Product to determine how much inert tracer is present in the water; and

b) using the amount of inert tracer present to determine the amount of Selected Treatment Product that is present in the water.

7. The method of Claim 1 in which said Compound is selected from the group consisting of benzenesulfonic acid, 4-hydroxy-3-{(2-hydroxy-1-naphthalenyl)azo}-, monosodium salt; 1-Naphthalenesulfonic acid, 3-hydroxy-4-{(2-hydroxy-5-methylphenyl)azo}-; 1-Naphthalenesulfonic acid, 3-hydroxy-4-{(1-hydroxy-2-naphthalenyl)azo}-, monosodium salt; and 2,7-Naphthalenedisulfonic acid, 3-{(5-chloro-2-hydroxyphenyl)azo}-4,5-dihydroxy-, disodium salt.

8. The method of Claim 2 in which said Compound is selected from the group consisting of

benzenesulfonic acid, 4-hydroxy-3-{(2-hydroxy-1-naphthalenyl)azo}-, monosodium salt;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(2-hydroxy-5-methylphenyl)azo}-;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(1-hydroxy-2-naphthalenyl)azo}-, monosodium salt; and

2,7-Naphthalenedisulfonic acid, 3-{(5-chloro-2-hydroxyphenyl)azo}-4,5-dihydroxy-, disodium salt.

9. The method of Claim 3 in which said Compound is selected from the group consisting of

benzenesulfonic acid, 4-hydroxy-3-{(2-hydroxy-1-naphthalenyl)azo}-, monosodium salt;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(2-hydroxy-5-methylphenyl)azo}-;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(1-hydroxy-2-naphthalenyl)azo}-, monosodium salt; and

2,7-Naphthalenedisulfonic acid, 3-{(5-chloro-2-hydroxyphenyl)azo}-4,5-dihydroxy-, disodium salt.

10. The method of Claim 4 in which said Compound is selected from the group consisting of

benzenesulfonic acid, 4-hydroxy-3-{(2-hydroxy-1-naphthalenyl)azo}-, monosodium salt;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(2-hydroxy-5-methylphenyl)azo}-;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(1-hydroxy-2-naphthalenyl)azo}-, monosodium salt; and

2,7-Naphthalenedisulfonic acid, 3-{(5-chloro-2-hydroxyphenyl)azo}-4,5-dihydroxy-, disodium salt.

11. The method of Claim 5 in which said Compound is selected from the group consisting of

benzenesulfonic acid, 4-hydroxy-3-{(2-hydroxy-1-naphthalenyl)azo}-, monosodium salt;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(2-hydroxy-5-methylphenyl)azo}-;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(1-hydroxy-2-naphthalenyl)azo}-, monosodium salt; and

2,7-Naphthalenedisulfonic acid, 3-{(5-chloro-2-hydroxyphenyl)azo}-4,5-dihydroxy-, disodium salt.

12. The method of Claim 6 in which said Compound is selected from the group consisting of

benzenesulfonic acid, 4-hydroxy-3-{(2-hydroxy-1-naphthalenyl)azo}-, monosodium salt;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(2-hydroxy-5-methylphenyl)azo}-;

1-Naphthalenesulfonic acid, 3-hydroxy-4-{(1-hydroxy-2-naphthalenyl)azo}-, monosodium salt; and

2,7-Naphthalenedisulfonic acid, 3-{(5-chloro-2-hydroxyphenyl)azo}-4,5-dihydroxy-, disodium salt.

13. The method of Claim 3 in which said treatment product is selected from the group consisting of polyacrylates, polymethacrylates, acrylate styrene sulfonate copolymers, ethylenediaminetetraacetic acid, nitrilotriacetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, hexamethylenediaminetetra methylene phosphonic acid, hexametaphosphate, tripolyphosphate, ortho phosphate, polyphosphonates, lignins, lignosulfonates, tannins, poly peptides, polyamines,

quaternary amines, celluloses, starches, polymaleic anhydrides, polyvinyl sulfonates, inorganic phosphates, organic phosphates, inorganic carbonates, organic carbonates, various surfactants and known salts thereof.

14. The method of Claim 4 in which said treatment product is selected from the group consisting of polyacrylates, polymethacrylates, acrylate styrene sulfonate copolymers, ethylenediaminetetraacetic acid, nitrilotriacetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, hexamethylenediaminetetra methylene phosphonic acid, hexametaphosphate, tripolyphosphate, ortho phosphate, polyphosphonates, lignins, lignosulfonates, tannins, poly peptides, polyamines, quaternary amines, celluloses, starches, polymaleic anhydrides, polyvinyl sulfonates, inorganic phosphates, organic phosphates, inorganic carbonates, organic carbonates, various surfactants and known salts thereof.

15. The method of Claim 5 in which said Selected Treatment Product is selected from the group consisting of polyacrylates, polymethacrylates, acrylate styrene sulfonate copolymers, ethylenediaminetetraacetic acid, nitrilotriacetic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, hexamethylenediaminetetra methylene phosphonic acid, hexametaphosphate, tripolyphosphate, polyphosphonates and known salts thereof.

16. The method of Claim 6 in which said Selected Treatment Product is selected from the group consisting of polyacrylates, polymethacrylates, acrylate styrene sulfonate copolymers, ethylenediaminetetraacetic acid, nitrilotriacetic acid,

1-hydroxyethylidene-1,1-diphosphonic acid, hexamethylenediaminetetra methylene phosphonic acid, hexametaphosphate, tripolyphosphate, polyphosphonates and known salts thereof.

17. The method of Claim 1 in which the Compound is formulated with an inert tracer in known proportion and a fluorometer is used to detect the fluorescent signal of said inert tracer and the fluorescent signal of the inert tracer is used to determine how much inert tracer is present and by knowing how much inert tracer is present it is determined how much Compound is present in the sample of water.

18. The method of Claim 2 in which the Compound is formulated with an inert tracer in known proportion and a fluorometer is used to detect the fluorescent signal of said inert tracer and the fluorescent signal of the inert tracer is used to determine how much inert tracer is present and by knowing how much inert tracer is present it is determined how much Compound is present in the water of the industrial water system.

19. The method of Claim 3 in which the Compound is formulated with an inert tracer in known proportion and a fluorometer is used to detect the fluorescent signal of said inert tracer and the fluorescent signal of the inert tracer is used to determine how much inert tracer is present and by knowing how much inert tracer is present it is determined how much Compound is present in the sample of water.

20. The method of Claim 4 in which the Compound is formulated with an inert tracer in known proportion and a fluorometer is used to detect the fluorescent signal of said inert tracer and the fluorescent signal of the inert tracer is used to determine how much inert tracer is present and by knowing how much inert tracer is present it is

determined how much Compound is present in the water of the industrial water system.

21. The method of Claim 5 in which the Compound is formulated with an inert tracer in known proportion and a fluorometer is used to detect the fluorescent signal of said inert tracer and the fluorescent signal of the inert tracer is used to determine how much inert tracer is present and by knowing how much inert tracer is present it is determined how much Compound is present in the sample of water.

22. The method of Claim 6 in which the Compound is formulated with an inert tracer in known proportion and a fluorometer is used to detect the fluorescent signal of said inert tracer and the fluorescent signal of the inert tracer is used to determine how much inert tracer is present and by knowing how much inert tracer is present it is determined how much Compound is present in the water of the industrial water system.

23. The method of Claim 1 in which said industrial water system is a boiler.

24. The method of Claim 2 in which said industrial water system is a boiler.

25. The method of Claim 3 in which said industrial water system is a boiler.

26. The method of Claim 4 in which said industrial water system is a boiler.

27. The method of Claim 5 in which said industrial water system is a boiler.

28. The method of Claim 6 in which said industrial water system is a boiler.